We Claim:

1. A control apparatus for a modulated power supply comprising:

an input for receiving a modulating signal;

a first coding unit which is arranged to receive the modulating signal and to generate a first control signal for controlling a first switching stage, the first control signal being related to the value of the modulating signal;

an error determining unit which is arranged to determine an error signal resulting from the difference between the modulating signal and the first control signal;

a second coding unit which is arranged to receive the error signal and to generate a second control signal for controlling a second switching stage, the second control signal being related to the value of the error signal.

2. A control apparatus according to claim 1 wherein the second coding unit has a set of possible coding values which are substantially distributed across the range of the error signal.

3. A control apparatus according to claim 1 wherein the first coding unit comprises a plurality of phases, the first control signal comprises a set of control signals for the phases and the first switching stage comprises at least one switching device per phase.

4. A control apparatus according to claim 3 wherein the error determining unit is arranged to sum contributions of the set of control signals on a periodic basis.

5. A control apparatus according to claim 4 wherein the error determining unit is further arranged to filter the sum of contributions of the set of control signals before comparison with the modulating signal.

6. A control apparatus according to claim 1 wherein the second coding unit comprises a plurality of phases, the second control signal comprises a set of set of control signals for the phases and the second switching stage comprises at least one switching device per phase.

7. A control apparatus according to claim 1 further comprising a time delay element for delaying the modulating signal whereby to time align corresponding parts of the modulating signal and the first control signal.

8. A control apparatus according to claim 1 further comprising a time delay element for delaying the first control signal whereby to time align corresponding parts of the first control signal and the second control signal.

9. A control apparatus according to claim 1 further comprising a third coding unit which is arranged to receive a further error signal formed by the difference between the error signal and the second control signal and to generate a third control signal for controlling a third switching stage, the third control signal being related to the value of the further error signal.

10. A control apparatus according to claim 1 further comprising M coding units arranged in parallel with one another, a processing unit which is arranged to generate M modified modulating signals, each coding unit being arranged to receive one of the modified modulating signals and wherein each of the coding units comprises a set of quantisation levels which are used to code the modified modulating signal and the M modified modulating signals are offset from one another by substantially 1/M of a quantisation level.

11. A control apparatus according to claim 10 wherein, for even values of M, the processing unit is arranged to generate M/2 modified modulating signals having a positive offset of substantially 1/2M of a quantisation level and M/2 modified modulating signals having a negative offset of substantially 1/2M of a quantisation level.

12. A control apparatus according to claim 11 wherein the processing unit is arranged to alternate between applying a positive offset and a negative offset on a periodic basis.

13. A control apparatus according to claim 12 wherein each coding unit has N phases and the processing unit is arranged to alternate between applying a positive offset and a negative offset after every N samples of the modulating signal.

14. A modulated supply incorporating the control apparatus of claim 1.

15. A modulated power supply according to claim 14 wherein each coding unit has an output stage which includes an inductor and wherein the value of the inductor is proportional to the relative ranges of the first and second coding units.

16. A modulated power supply according to claim 15 wherein at least one of the first and second coding units comprises a plurality of phases and the value of the inductor is further proportional to the relative number of phases in the first and second coding units.

17. A modulated power supply according to claim 14 wherein the modulating input signal is an envelope of a signal for processing by a power amplifier and an output of the power supply forms a power supply for the power amplifier.

18. A power amplifier comprising an amplifying device and a modulated power supply according to claim 14, wherein the amplifying device has an input for receiving an input signal for amplification, wherein an envelope level of the input signal is fed to the power supply as the modulating input signal and an output of the power supply forms a power supply for the power amplifier.

19. A wireless base station comprising a power amplifier according to claim 18.

20. A method of generating a power supply signal using a modulated power supply comprising:

receiving a modulating signal;

receiving the modulating signal at a first coding unit and generating a first control signal for controlling a first switching stage, the first control signal being related to the value of the modulating signal;

determining an error signal resulting from the difference between the modulating signal and the first control signal;

receiving the error signal and generating a second control signal for controlling a second switching stage, the second control signal being related to the value of the error signal.

21. A power supply signal resulting from the method of claim 20.

22. A computer program product for implementing a method of controlling operation of a modulated power supply, the computer program product comprising instructions which are arranged to cause a control apparatus of the supply to:

receive a modulating signal;

receive the modulating signal and generate a first control signal for controlling a first switching stage, the first control signal being related to the value of the modulating signal;

determine an error signal resulting from the difference between the modulating signal and the first control signal;

receive the error signal and generate a second control signal for controlling a second switching stage, the second control signal being related to the value of the error signal.

23. A control apparatus for a modulated power supply comprising:

an input for receiving a modulating input signal;

a processing unit which is arranged to receive the modulating signal and to generate M modified modulating signals;

M coding units arranged in parallel with one another, each coding unit being arranged to receive one of the modified modulating signals and to generate a control signal for controlling a switching stage, the control signal being related to the value of the modified modulating signal;

wherein each of the coding units comprises a set of quantisation levels which are used to code the modified modulating signal and the M modified modulating signals are offset from one another by substantially 1/M of a quantisation level.

24. A control apparatus according to claim 23 wherein, for even values of M, the processing unit is arranged to generate M/2 modified modulating signals having a positive offset of substantially 1/2M of a quantisation level and M/2 modified modulating signals having a negative offset of substantially 1/2M of a quantisation level.

25. A control apparatus according to claim 23 wherein, for odd values of M, the processing unit is arranged to generate (M-1)/2 modified modulating signals having a positive offset of substantially 1/2M of a quantisation level and (M-1)/2 modified

modulating signals having a negative offset of substantially 1/2M of a quantisation level.

26. A control apparatus according to claim 23 wherein the processing unit is arranged to alternate between applying a positive offset and a negative offset on a periodic basis.

27. A control apparatus according to claim 26 wherein each coding unit has N phases and the processing unit is arranged to alternate between applying a positive offset and a negative offset after every N samples of the modulating signal.

28. A modulated supply incorporating the control apparatus of claim 23.

29. A method of generating a power supply signal using a modulated power supply comprising M coding units arranged in parallel with one another, each coding unit having a set of quantisation levels, the method comprising:

receiving a modulating input signal;

generating M modified modulating signals;

applying the modified modulating signals to the M coding units, each coding unit being arranged to receive one of the modified modulating signals and to generate a control signal for controlling a switching stage, the control signal being related to the value of the modified modulating signal;

wherein the M modified modulating signals are offset from one another by substantially 1/M of a quantisation level.

30. A power supply signal resulting from the method of claim 29.

31. A computer program product for implementing the method of claim 29.

32. A control apparatus for a modulated power supply comprising:

an input for receiving a modulating input signal;

M coding units arranged in parallel with one another, each coding unit being arranged to receive the modulating signal and to generate a control signal for controlling a switching stage, the control signal being related to the value of the modified modulating signal;

wherein each of the coding units comprises a set of quantisation levels which are used to code the modified modulating signal and the sets of quantisation levels of the M coding units are offset from one another by substantially 1/M of a quantisation level.

33. A method of generating a power supply signal using a modulated power supply comprising M coding units arranged in parallel with one another, each coding unit having a set of quantisation levels, the method comprising:

receiving a modulating input signal;

applying the modulating signal to the M coding units, each coding unit being arranged to receive the modulating signal and to generate a control signal for controlling a switching stage, the control signal being related to the value of the modified modulating signal;

wherein the sets of quantisation levels of the M coding units are offset from one another by substantially 1/M of a quantisation level.

34. A power supply signal resulting from the method of claim 33.

35. A computer program product for implementing the method of claim 33.